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PINPOINTING THE TECHNOLOGICAL FAULT IN APPLIED BEHAVIOR ANALYSIS

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The Problem

I believe Steve Hayes is correct in many respects. Clearly, we failed to transfer the technology of behavioral environmental intervention to long-lasting sources of control. However, the problems that evolved in behavioral environmental technology need not occur in other areas. I believe we have learned a great deal over the past 10 to 15 years about how to get a program adopted. In fact, some of our successes are beginning to emerge. The work on driver safety has been a success as evidenced by an impressive collection of papers on road safety research published recently in a special section of the *Journal of Applied Behavior Analysis* (e.g., Berry & Geller, 1991; Hagenzieker, 1991; Ludwig & Geller, 1991). I also believe that staff management programs in the human services promise to contribute a great deal to effective treatment practices and have been adopted by enough organizations to ensure that they will not disappear soon, especially because some of them have improved the funding picture for the organizations in which they were applied (e.g., Parsons, Cash, & Reid, 1989).

In some cases, program adoption has been a direct result of the efforts of scientists who developed the technology in the first place. For example, in the area of industrial safety, programs developed originally under controlled circumstances have been disseminated to numerous organizations through workshops (e.g., Geller, Lehman, & Kalsher, 1989) and publications in nonbehavioral journals (e.g., Geller, 1988). In other cases, research findings have been used by "adoption" specialists to develop programs for solving practical problems. The efforts of Aubrey Daniels, for example, in the area of performance management illustrate this well (see *Performance Management Magazine* for examples of adoption). Because of Aubrey's efforts, 3-M, Kodak, and other large corporations have adopted behavioral technology strategies and, in some cases, their representatives have attended professional conferences to present their results (e.g., Justice, 1990).

Unfortunately, behavioral strategies for promoting adoption tend to be "nonanalytic" and, much like generalization-promotion strategies, have not been well explained in terms of the variables affecting success. Some individuals are effective in getting programs adopted, others are not; little analytical work is available to explain the differences. This approach is not sufficient for the promotion of adoption on a large scale, and more explicit strategies are needed.

Possible Causes of the Problem

I believe we have been influenced to focus our time and energy on the procedural and technological elements of behavior analysis and have not been required by our training institutions and journals to emphasize adoption technology. In this regard, publications in behavioral journals virtually ignore contextual factors such as the position of researchers in the organization where the work was done or variables affecting maintenance of an intervention once initial research is finished. In most cases, we do not describe the conditions that led to permission to implement a program or consider benefits to an organization of continuing a program after initial research has been completed.

Some examples in the environmental protection area illustrate failure to consider systems-level benefits. For example, Stokes and Fawcett (1977) implemented a "refuse packaging" program in which citizens were encouraged to package their garbage in ways that made pick-up more convenient and

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manageable for the workers. Although this seems like a reasonable approach, those who physically pick up the garbage do not control policy and do not directly influence adoption. No mention was made of those who managed the garbage operation or the benefits to the organization over the long run. The link between convenient pick-up and organization survival was not described. I can certainly think of some good reasons for adopting such a policy (e.g., increased speed of trash pick-up, fewer injuries), but only minimal efforts were made to determine if these were benefits to policy makers or if, in fact, changes in packaging of refuse by citizens influenced any of these factors. The same criticisms can be applied to a study by Hayes and Cone (1981) in which feedback was used to decrease the use of electricity by consumers. Why would a utility company encourage conservation? It is likely that their profits would decrease, and their purpose in the culture might be diminished. Conservation does not keep the company that sells the conserved service or product in business.

Some might argue that our purpose is not to serve organizations interested in profits and that we should focus our efforts on benefits to the greater culture. I agree in general, but can one ignore the organizations that make up the culture and their survival interests (no matter how selfish)? I think not. We must create change "through" them, not "around" them. A more socially valid approach would be to determine conditions that would make conservation worthwhile to the greater culture and to the organizations serving the greater culture (e.g., what conditions would motivate a utility company to encourage conservation).

The "systems" error is common in organizational behavior management (OBM) research and practice. Typically, descriptions of OBM methods begin with pinpointing and continue with measurement, analysis, change, evaluation, and so on. Little emphasis is given to identifying for the organizational culture the importance of change in the pinpointed behavior. Yet, this is precisely the factor that controls adoption. When deposit bottles are used, what are the effects on jobs and the economy? If people use electricity more efficiently, who benefits? Who is harmed? Certainly social validity has raised this issue for consideration, but we often have contrived social validity definitions and measures to suit only limited purposes.

Zemke and Gunkler (1982) provided an instructive example of an effective method to extend behavior analysis beyond a short-term demonstration project and developed an acceptable, socially valid intervention program. They developed a results-referenced feedback system in a theme park. Before beginning the staff behavior-change process, they identified outcomes important to continuation of the park. This was done through extensive interviews with the park managers and indicated that consumer satisfaction was a critical factor; when people had fun, they tended to return. A consumer satisfaction measurement system was developed and implemented so that regular customer reports of satisfaction levels could be obtained. Subsequently, staff behaviors contributing to satisfaction were pinpointed and targeted for change. Managers handed out tokens to staff when they observed the target behaviors and, in some cases, customers were given tokens for delivery to staff members when they performed well. The value of the tokens was linked to overall satisfaction reports (based on data collected in surveys and posted on a large chart in the park). When the satisfaction reports were positive, the tokens could be exchanged for more valuable prizes than when satisfaction reports were negative. These procedures illustrate the link between behavior and system that is so often missing in applied behavior analysis research. I believe this missing link is a major contributor to the lack of an effective adoption technology.

A Possible Solution

I do not believe we are too technological. In my view, we are simply technological about some things (i.e., research procedures) and not others (i.e., adoption). This can be remedied in at least two ways.

Context description. Each published study should include a section describing the broad context in which the study was accomplished. This section should describe how the study came about, the role of the researchers in the setting in which

Table 1
Steps Included in a Systems Approach to Behavioral Interventions

Step	Description
Systems analysis	Describe overall organizational objectives; identify inputs and outputs important to organization functioning.
Results-referenced pinpoint	Identify specific behaviors to be changed and link them to overall organizational objectives.
Measurement	Devise a method for assessing preintervention levels of behaviors and behavior change following intervention.
Analysis	Identify immediate and remote antecedents and consequences of behaviors targeted for change.
Change	Alter immediate and/or remote antecedents and consequences to effect a change in behavior.
Evaluation	Assess changes in behaviors and overall organization functioning.
Assess emotional effects	Assess emotional effects of changes based on verbal reports (e.g., job satisfaction) and observations of escape or avoidance (e.g., absenteeism).

the research was done (e.g., control over reinforcers, formal position in the administrative hierarchy), and other contextual factors that could influence the results. Such information could lead to the development of a technology of context, providing clues regarding conditions important to adoption.

Explicit systems analysis. Each study should include a description of organizational goals to which a specific intervention relates (this also might apply to a family system) and a description of linkages between the behaviors targeted in the study and the organizational goals. What problem is being solved at the systems level by changing pinpointed behaviors? What will happen to the host organization if the study is successful? What outcomes show that the behavior change produced a valuable outcome for the host organization? Tom Gilbert (1978) has addressed this issue in his Performance Engineering Matrix by considering several levels of change within and outside an organization and specifying linkages among them, including philosophy, culture, policy, strategy, tactics, and logistics. Most often, behavior-change interventions operate at the tactics level with no clarification of explicit relationship to higher levels. The Total Performance System (Brethower, 1982) provides another example of this ecological or systems-level approach by considering the influence of organizational outputs on the receiving system (consumers) for products or services and altering internal processes to facilitate survival of the organization in the marketplace. For additional information on application of this systems approach in public and private sectors, see Redmon and Agnew (in press) and Redmon and Wilk (in press).

Table 1 lists a set of intervention steps I believe should be used to guide intervention development, application, and evaluation. The first step is a systems analysis (description of organizational mission, culture, needs, etc.). The second step involves developing a results-referenced pinpoint in which behaviors important to organizational success are targeted for change. Subsequent steps are typical of many interventions, including measurement, analysis, change, and evaluation. Note that measurement includes tracking specific behaviors as well as indicators of the effects of behavior changes on the overall outputs of an organization. Additionally, it is noteworthy that both immediate and remote events are included in the analysis and change portions of the model, with "immediate" emphasizing the usual antecedents/consequences and "remote" emphasizing events removed by one or two levels from the behavior (e.g., feedback from the executive office) or events separated in time from the behaviors of interest (e.g., monthly compensation).

Verifying the Fault

A few years ago, one of my graduate students and I reviewed several dozen articles on behavioral

consultation from a variety of journals. The purpose of our review was to determine how much emphasis was placed on assessing organizational context prior to implementing an intervention and how much emphasis was given to steps following the successful implementation of an intervention (e.g., maintenance). We examined the consultation methods in terms of 10 categories (preentry, organization entry, goal setting, procedure selection, role definition, implementation, evaluation, maintenance, withdrawal, and follow-up) to determine where most of the technology was focused. We found that all papers considered the "middle" phases of implementation and evaluation, but that few considered the beginning phases (preentry and entry) or the last few phases (maintenance, withdrawal, and follow-up) (Redmon & Lockwood, 1986). This pattern characterizes clearly the lack of a science of adoption in behavior analysis. We focus our efforts on implementation—the techniques that produce changes of immediate interest—and give little attention to the preparation needed to implement the program successfully or to leaving an effective program in place. By approaching science in this way, we are ignoring information needed to develop a technology of context and, eventually, adoption.

Concluding Comments

The above commentary highlights existing analytical methods in the form of systems analysis to suggest ways of developing adoption technology in organizations. Systems models characterize contexts within which interventions are applied and, as such, direct attention to support systems that must benefit if programs are to be retained. Although systems approaches provide an effective beginning for these efforts, only data obtained from careful studies of organizational contingencies will provide a scientific basis for progress. It is time to expand the scope of analysis in behavioral research so we can build a stronger base for future work.

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